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Giobbi

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(54) **SECURITY SYSTEM AND METHOD FOR CONTROLLING ACCESS TO COMPUTING RESOURCES**

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H04L 9/32	(2006.01)
G06F 21/35	(2013.01)
G06F 21/34	(2013.01)

(52) **U.S. Cl.**

CPC ***G06F 21/35*** (2013.01); ***G06F 21/34*** (2013.01); *G06F 2221/2115* (2013.01)

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CPC G07F 17/32; G07F 7/1008; G07F 7/0886; G06K 19/07749; G06K 19/0723; H04W 12/06; H04W 84/18; H04W 84/12; H04W 4/008; G06Q 20/341; G06Q 20/32; G06Q 20/10; G06Q 20/3278; G06Q 20/327; G06Q 20/352; H04L 63/0492; H04L 2209/80; H04L 2012/2841; G06F 21/34; G06F 21/35; G06F 2221/2115

USPC 726/16, 21, 27

See application file for complete search history.

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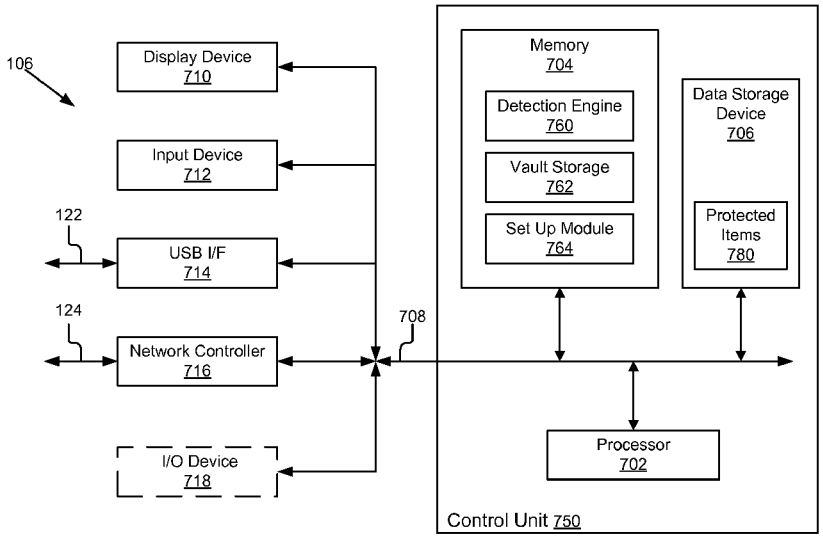
(57) **ABSTRACT**

A security system comprises a personal digital key (PDK), a reader and a computing device. The PDK is a portable, personal transceiver that includes a controller and one or more passwords or codes. The computing device includes a detection engine, vault storage and a set up module. The detection engine detect events relating to the access of any files and third-party systems by the computing device and receives information from the reader as to whether the PDK is present/linked. The detection engine controls whether a user is able to access any of the functionality provided by the computing device based upon whether the PDK is in communication with the reader or not. The present invention also includes a number of methods such as a method for initializing the security system, a method for setting up a computing device, and a method for controlling access to computing resources.

23 Claims, 14 Drawing Sheets



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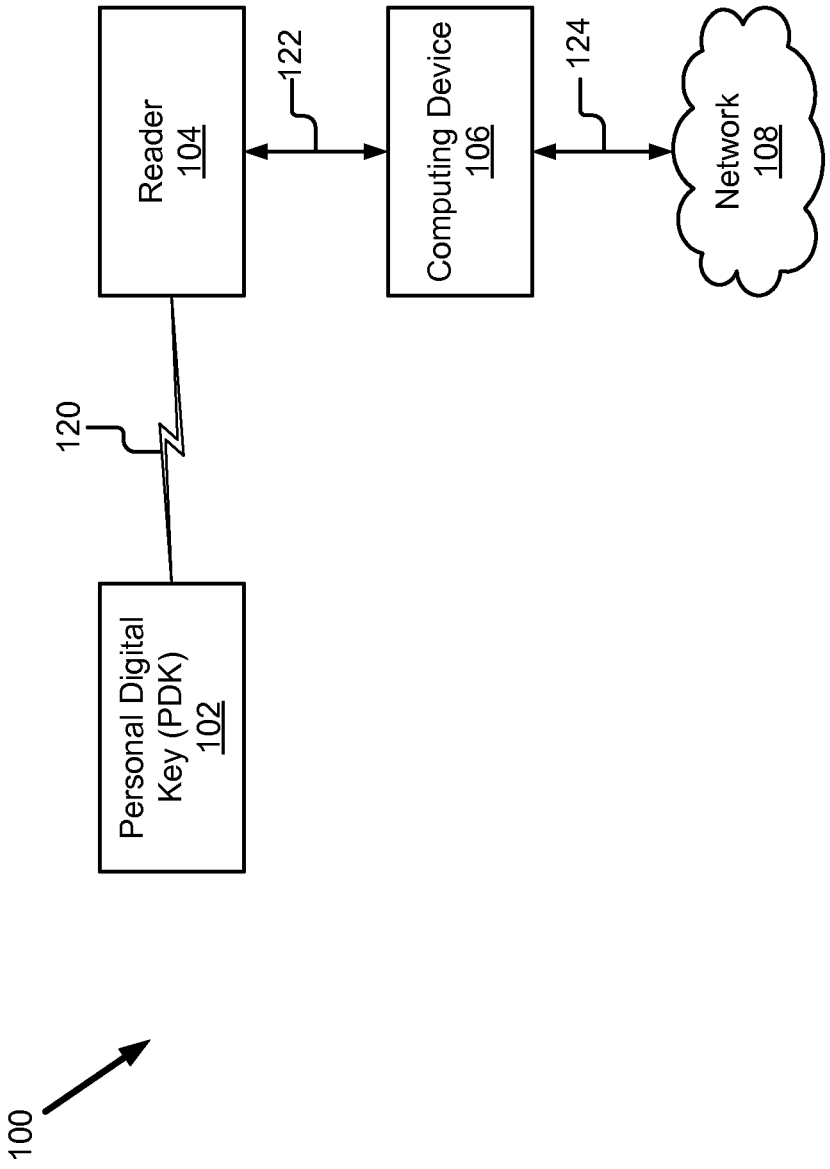
Reader
104
122
Computing Device
106
124
Network
108
120
Personal Digital
Key (PDK)
102
100

Figure 1

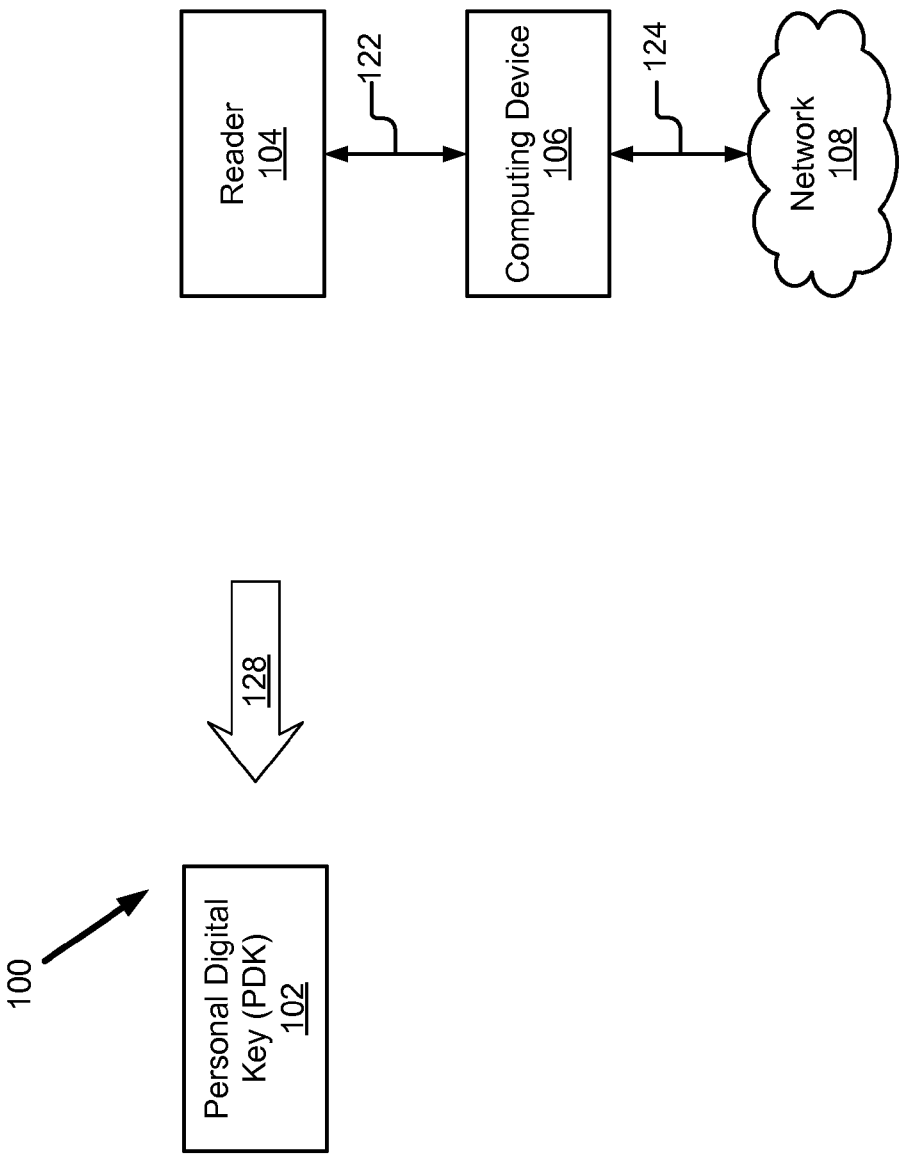
Reader
104
122
Computing Device
106
124
Network
108
128
100
Personal Digital
Key (PDK)
102

Figure 2

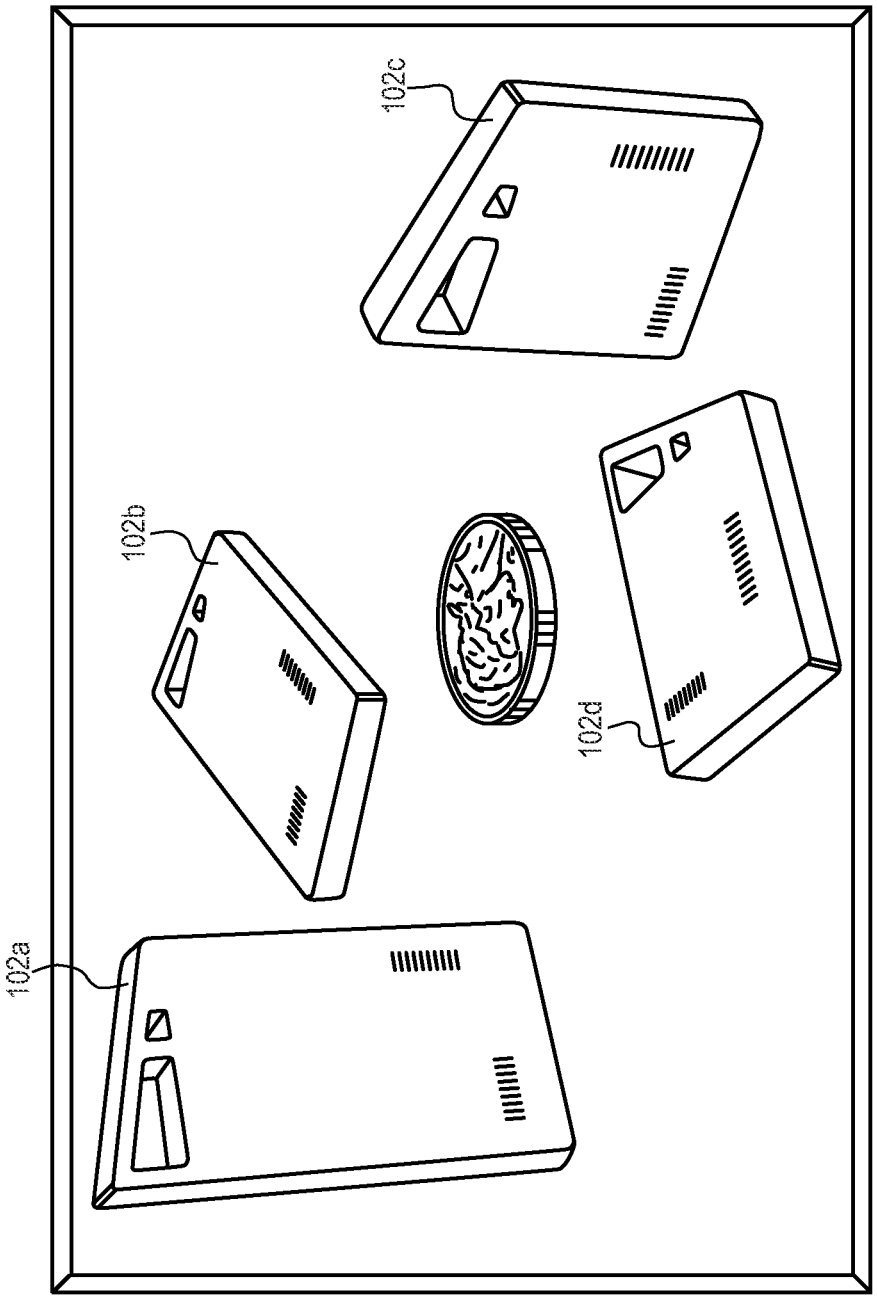

Figure 3

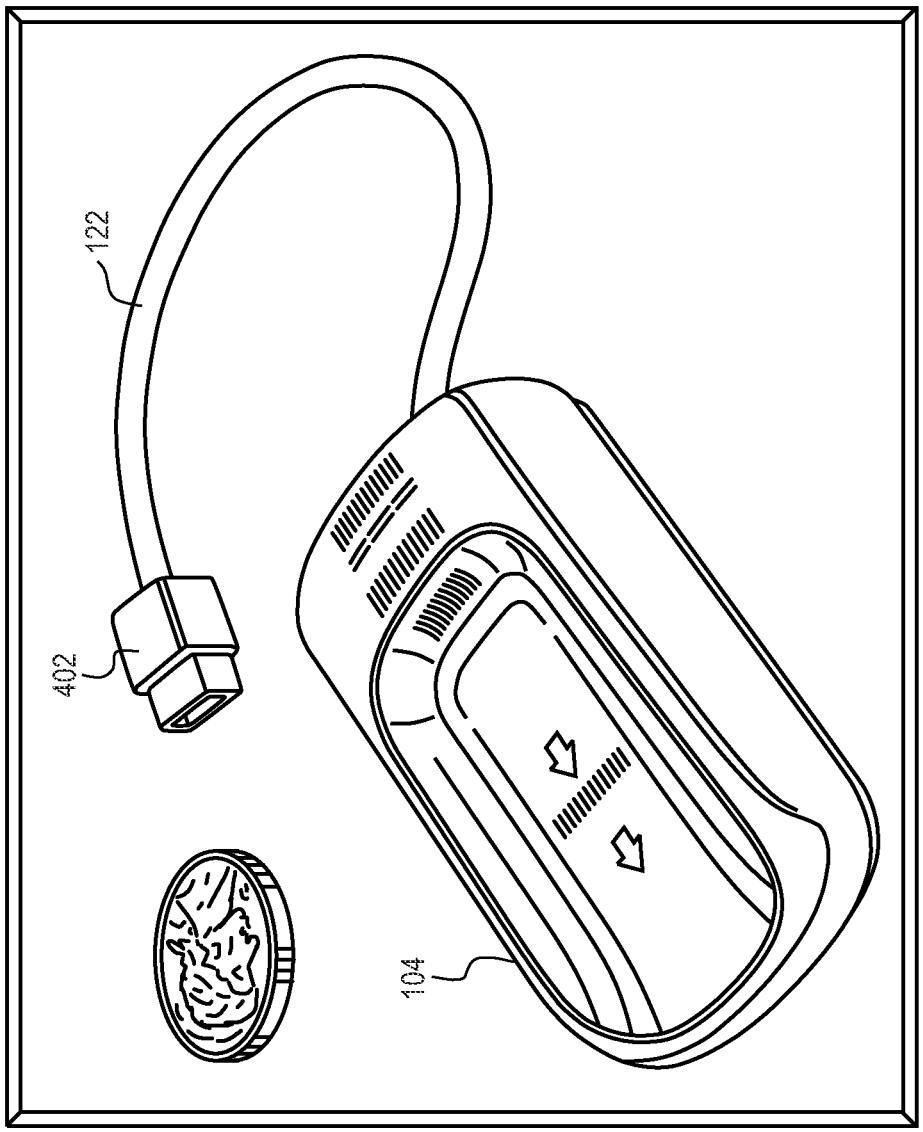

Figure 4

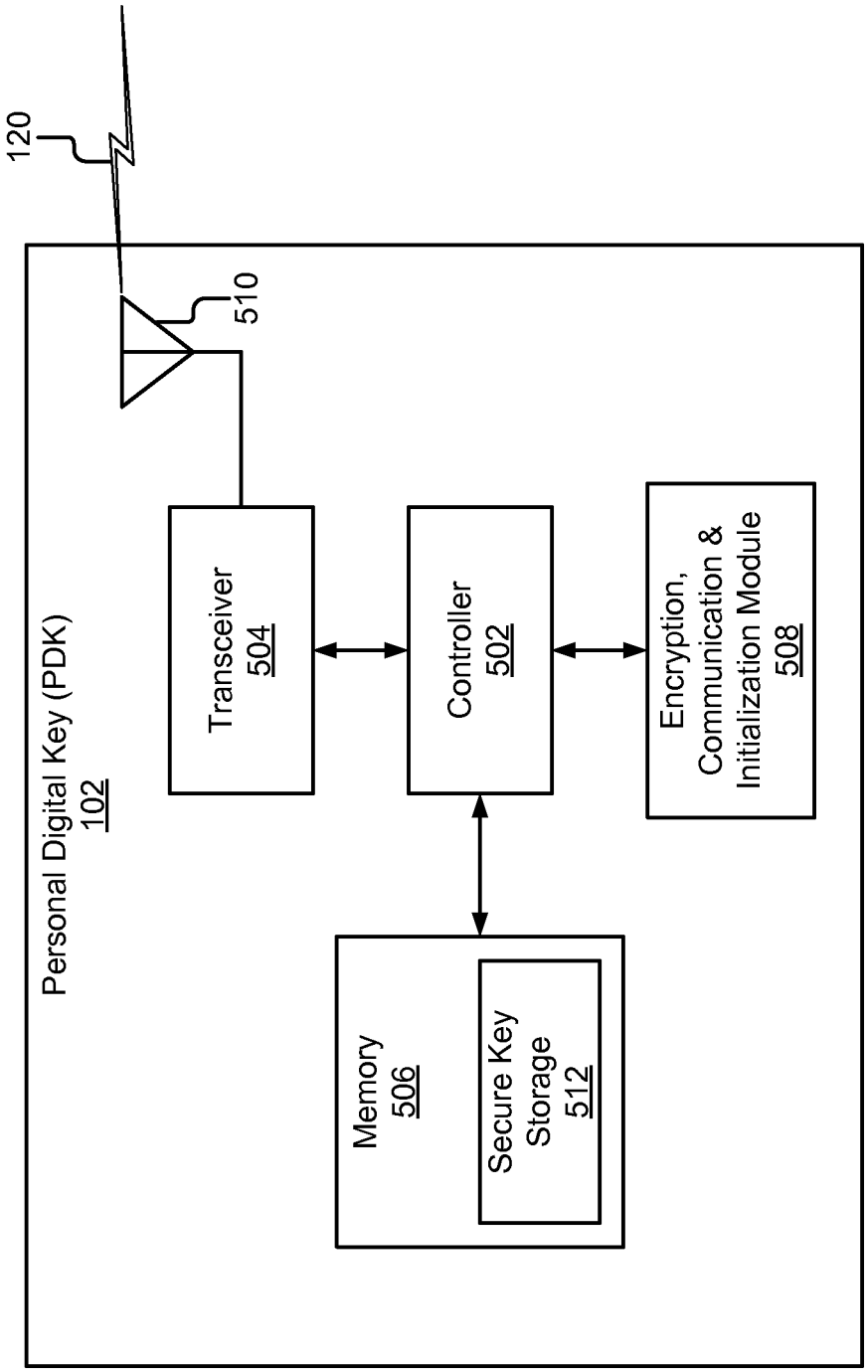
120
510
Personal Digital Key (PDK)
102
Transceiver
504
Controller
502
Encryption, Communication & Initialization Module
508
Memory
506
Secure Key Storage
512

Figure 5

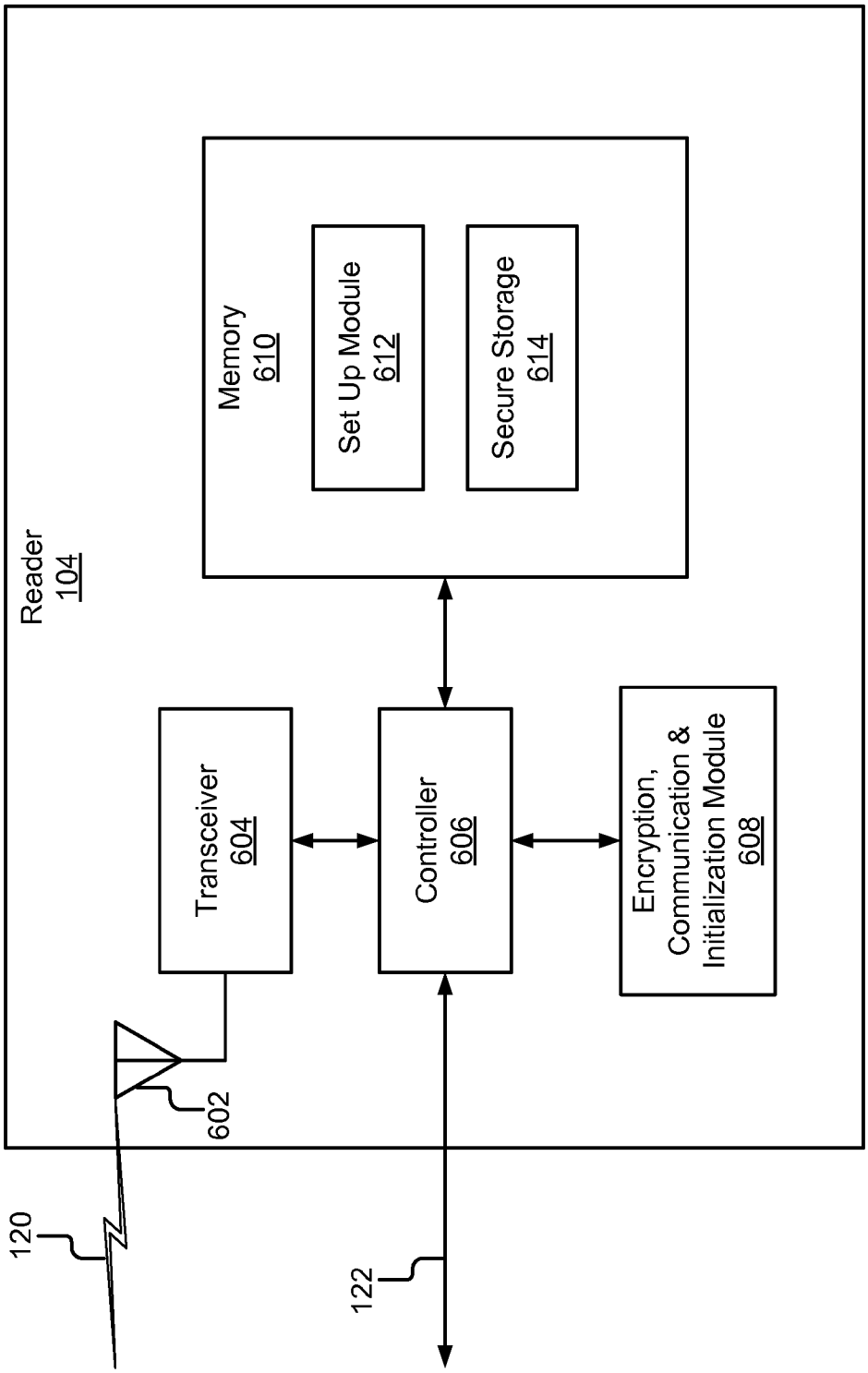
Reader
104
Memory
610
Set Up Module
612
Secure Storage
614
Transceiver
604
Controller
606
Encryption,
Communication &
Initialization Module
608
602
120
122

Figure 6

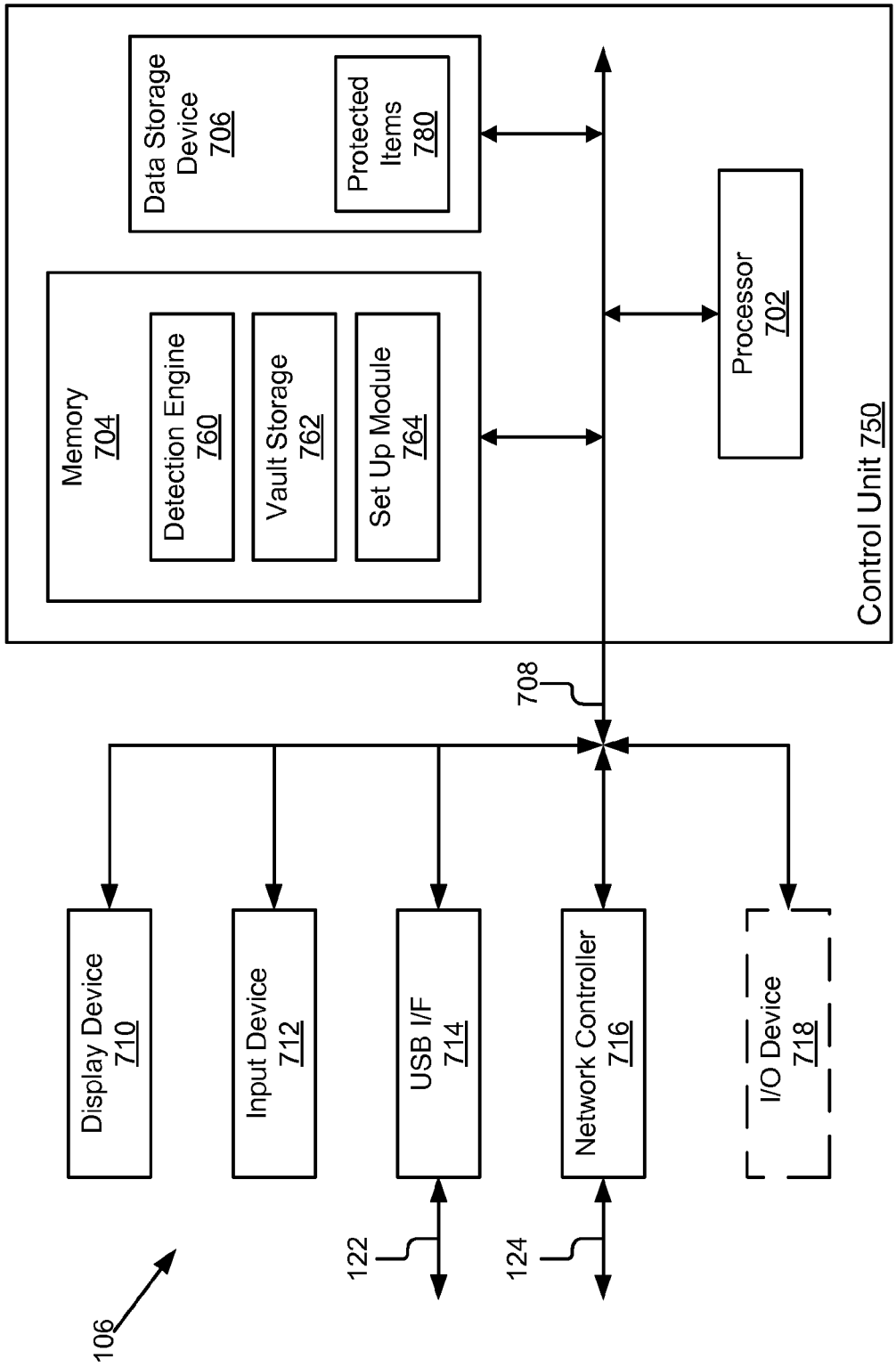
Control Unit 750
Data Storage Device 706
Protected Items 780
Memory 704
Detection Engine 760
Vault Storage 762
Set Up Module 764
Processor 702
708
Display Device 710
Input Device 712
USB I/F 714
Network Controller 716
I/O Device 718
122
124
106

Figure 7

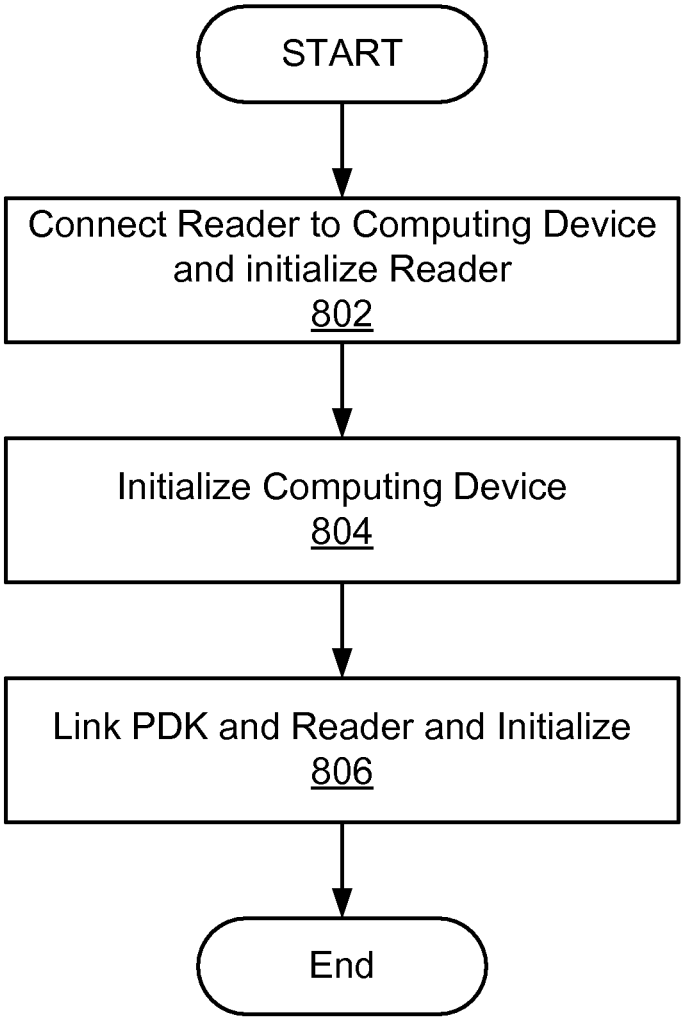
START
Connect Reader to Computing Device and initialize Reader
802
Initialize Computing Device
804
Link PDK and Reader and Initialize
806
End

Figure 8

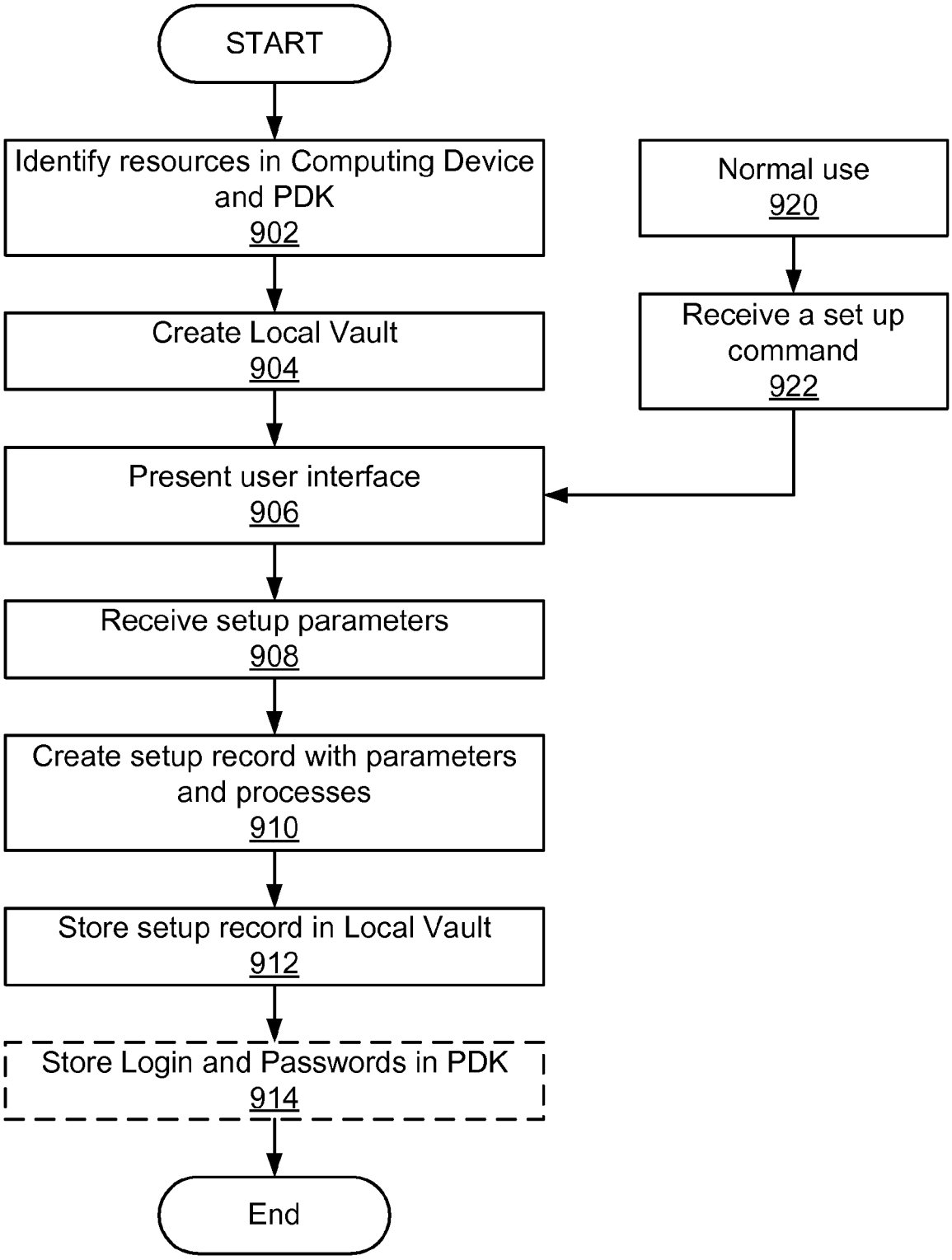
START
Identify resources in Computing Device and PDK
902
Create Local Vault
904
Present user interface
906
Receive setup parameters
908
Create setup record with parameters and processes
910
Store setup record in Local Vault
912
Store Login and Passwords in PDK
914
End
Normal use
920
Receive a set up command
922

Figure 9

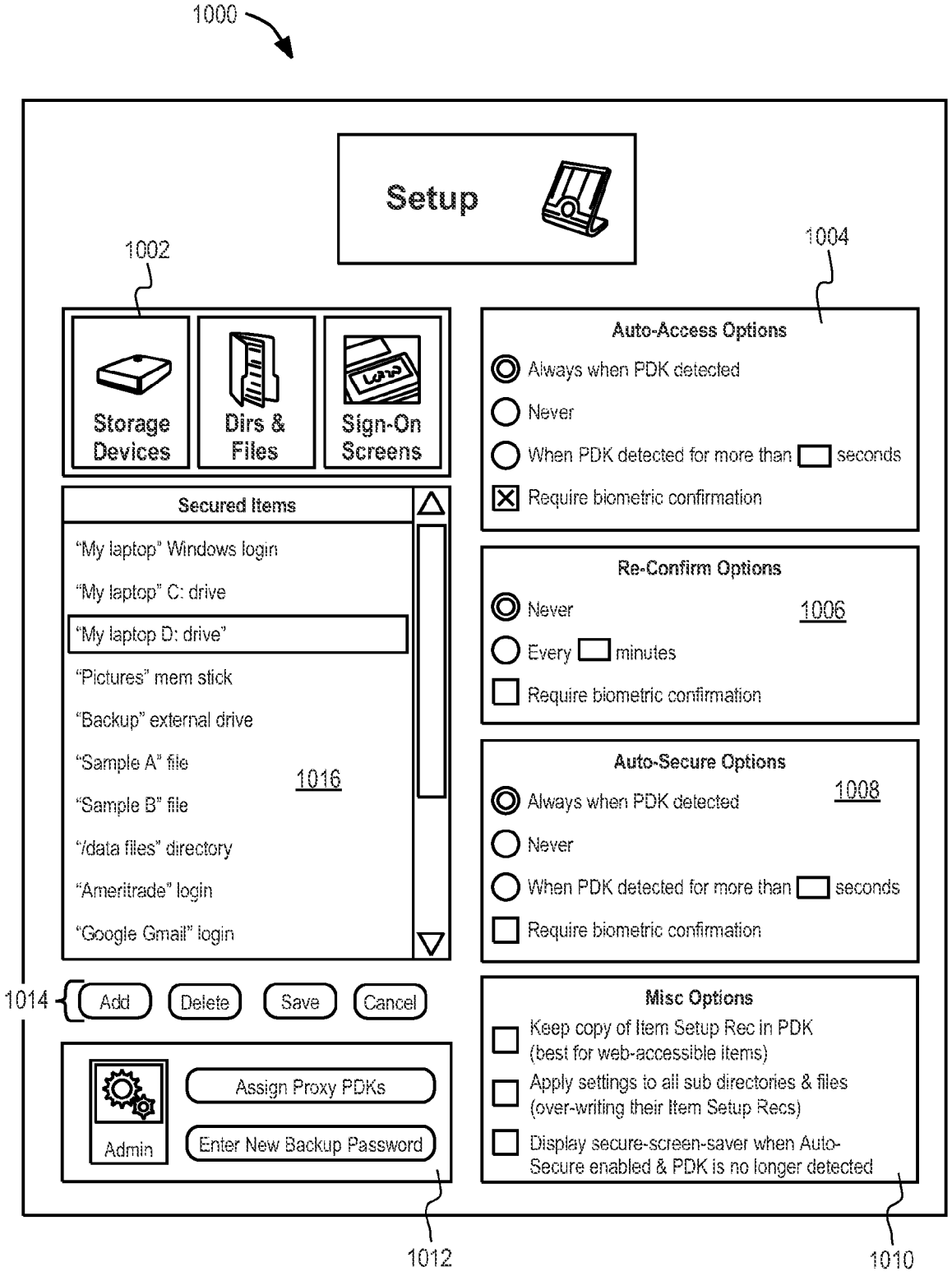
1000
Setup
1002
1004
Storage Devices
Dirs & Files
Sign-On Screens
Auto-Access Options
Always when PDK detected
Never
When PDK detected for more than seconds
Require biometric confirmation
Secured Items
"My laptop" Windows login
"My laptop" C: drive
"My laptop D: drive"
"Pictures" mem stick
"Backup" external drive
"Sample A" file
"Sample B" file
"/data files" directory
"Ameritrade" login
"Google Gmail" login
1016
Re-Confirm Options
Never
1006
Every minutes
Require biometric confirmation
Auto-Secure Options
Always when PDK detected
1008
Never
When PDK detected for more than seconds
Require biometric confirmation
1014
Add
Delete
Save
Cancel
Misc Options
Keep copy of Item Setup Rec in PDK (best for web-accessible items)
Apply settings to all sub directories & files (over-writing their Item Setup Recs)
Display secure-screen-saver when Auto-Secure enabled & PDK is no longer detected
Admin
Assign Proxy PDKs
Enter New Backup Password
1012
1010

Figure 10

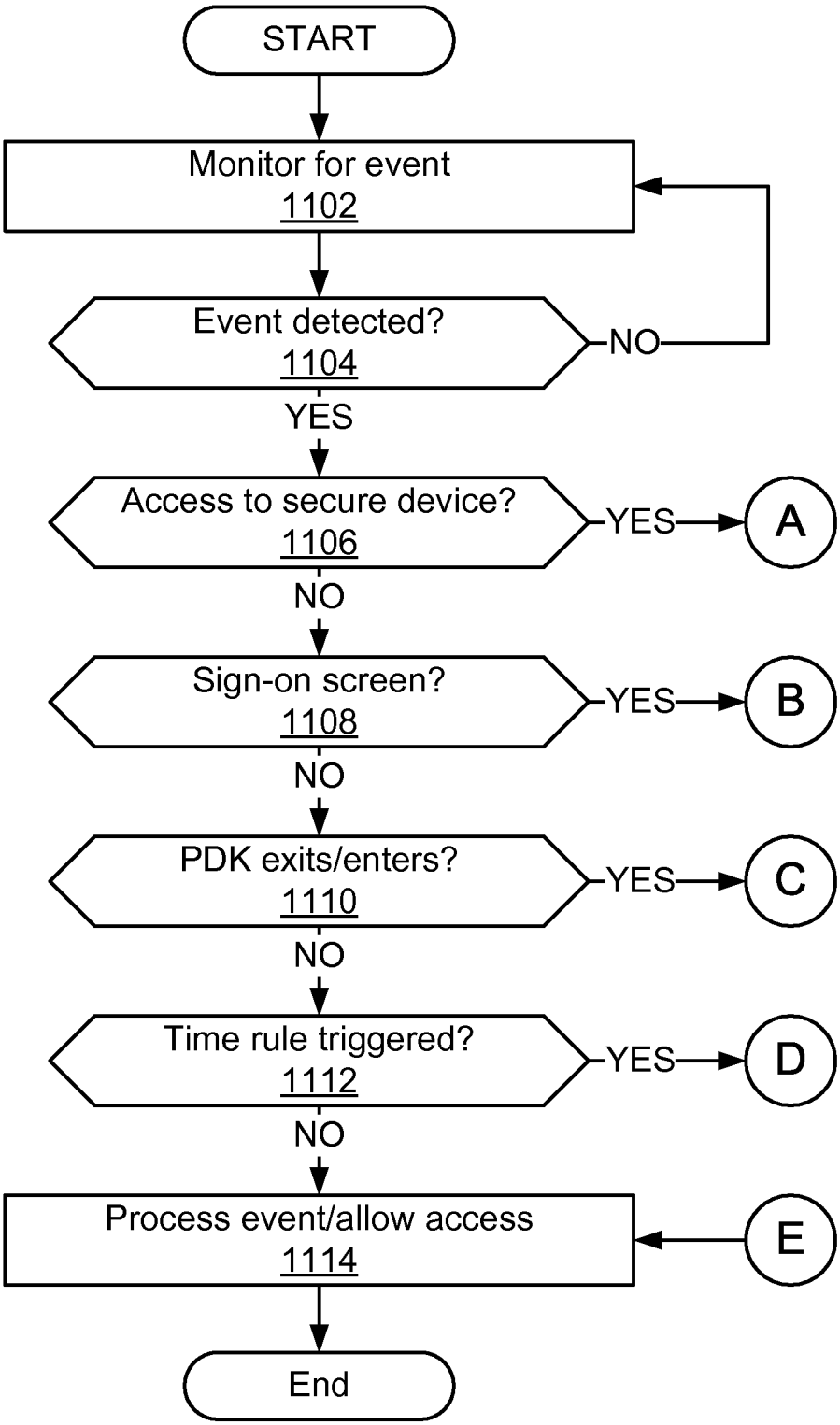
START
Monitor for event
1102
Event detected?
1104
NO
YES
Access to secure device?
1106
YES
A
NO
Sign-on screen?
1108
YES
B
NO
PDK exits/enters?
1110
YES
C
NO
Time rule triggered?
1112
YES
D
NO
Process event/allow access
1114
E
End

Figure 11A

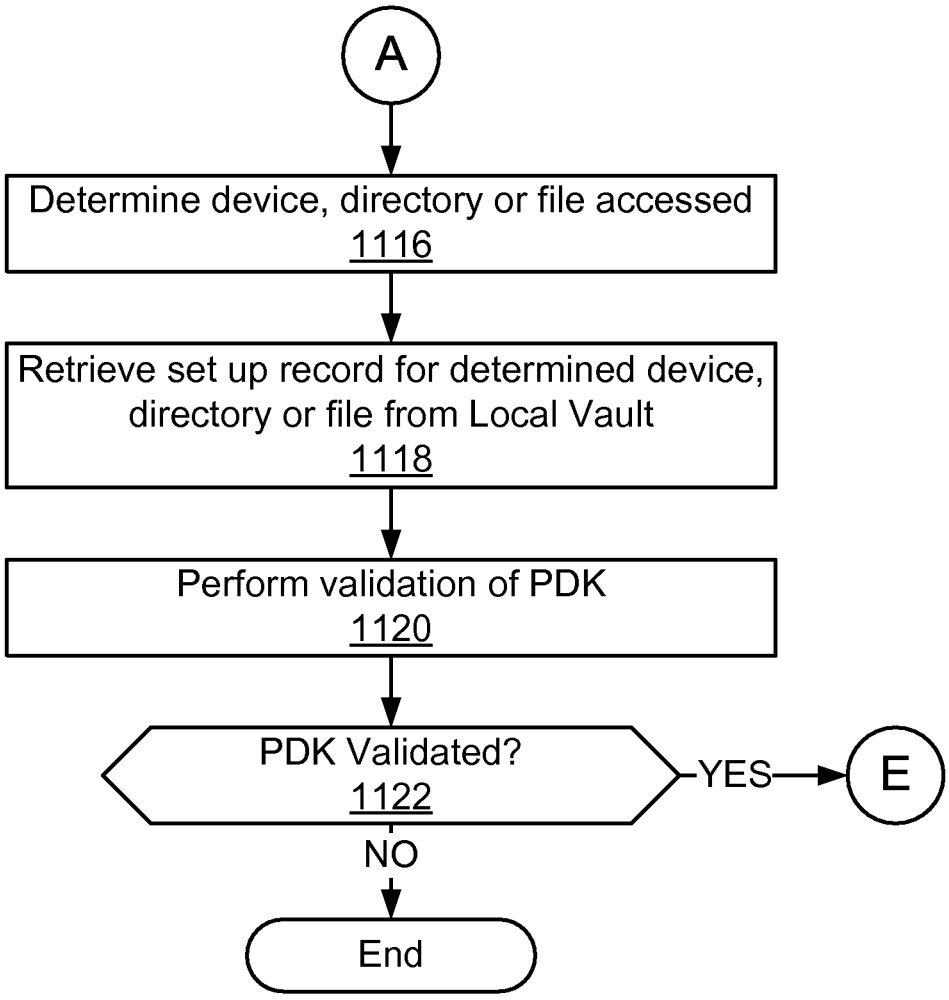
A
Determine device, directory or file accessed
1116
Retrieve set up record for determined device, directory or file from Local Vault
1118
Perform validation of PDK
1120
PDK Validated?
1122
YES
E
NO
End

Figure 11B

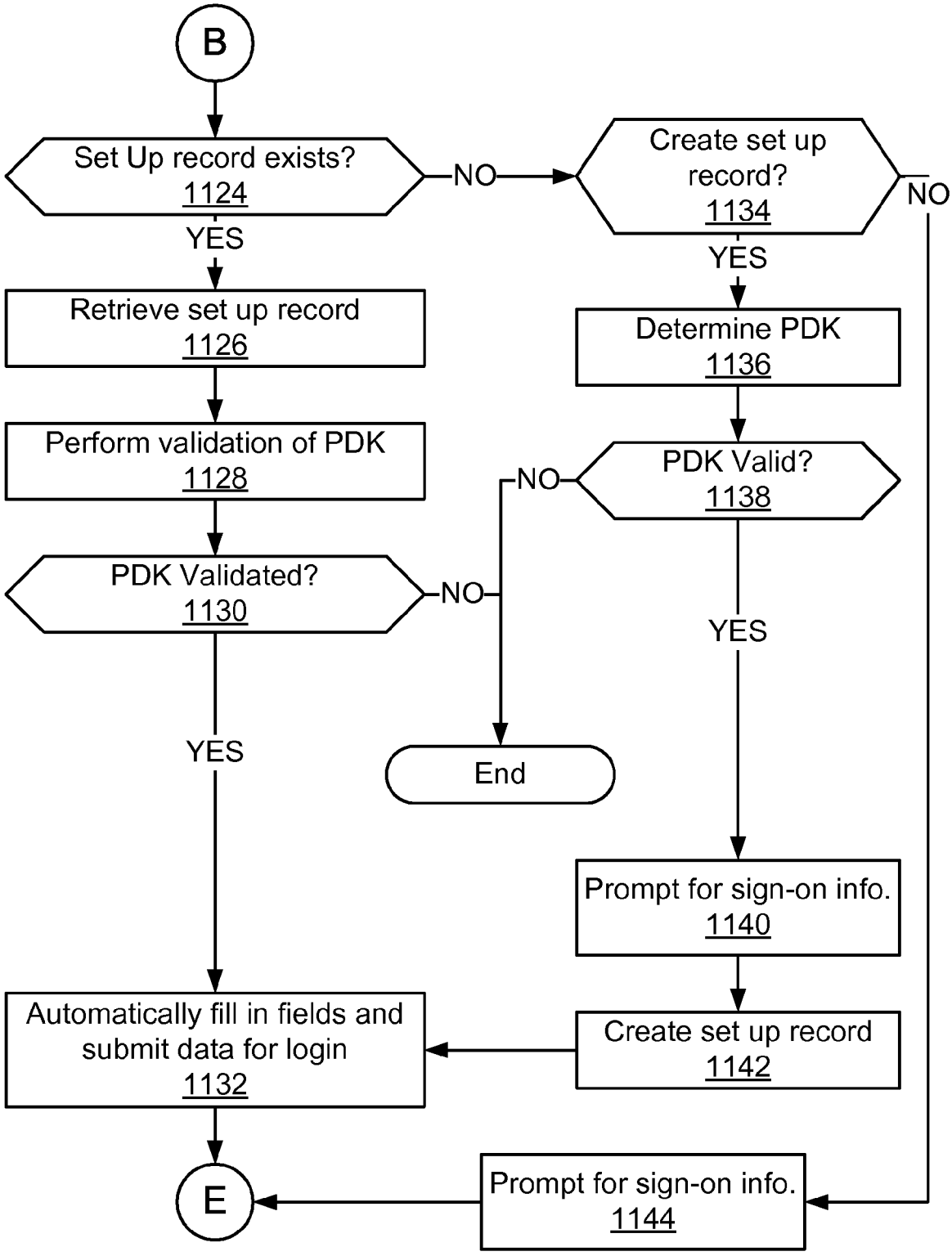
B
Set Up record exists?
1124
NO
Create set up record?
1134
NO
YES
YES
Retrieve set up record
1126
Determine PDK
1136
Perform validation of PDK
1128
PDK Valid?
1138
NO
PDK Validated?
1130
NO
YES
YES
End
Prompt for sign-on info.
1140
Automatically fill in fields and submit data for login
1132
Create set up record
1142
E
Prompt for sign-on info.
1144

Figure 11C

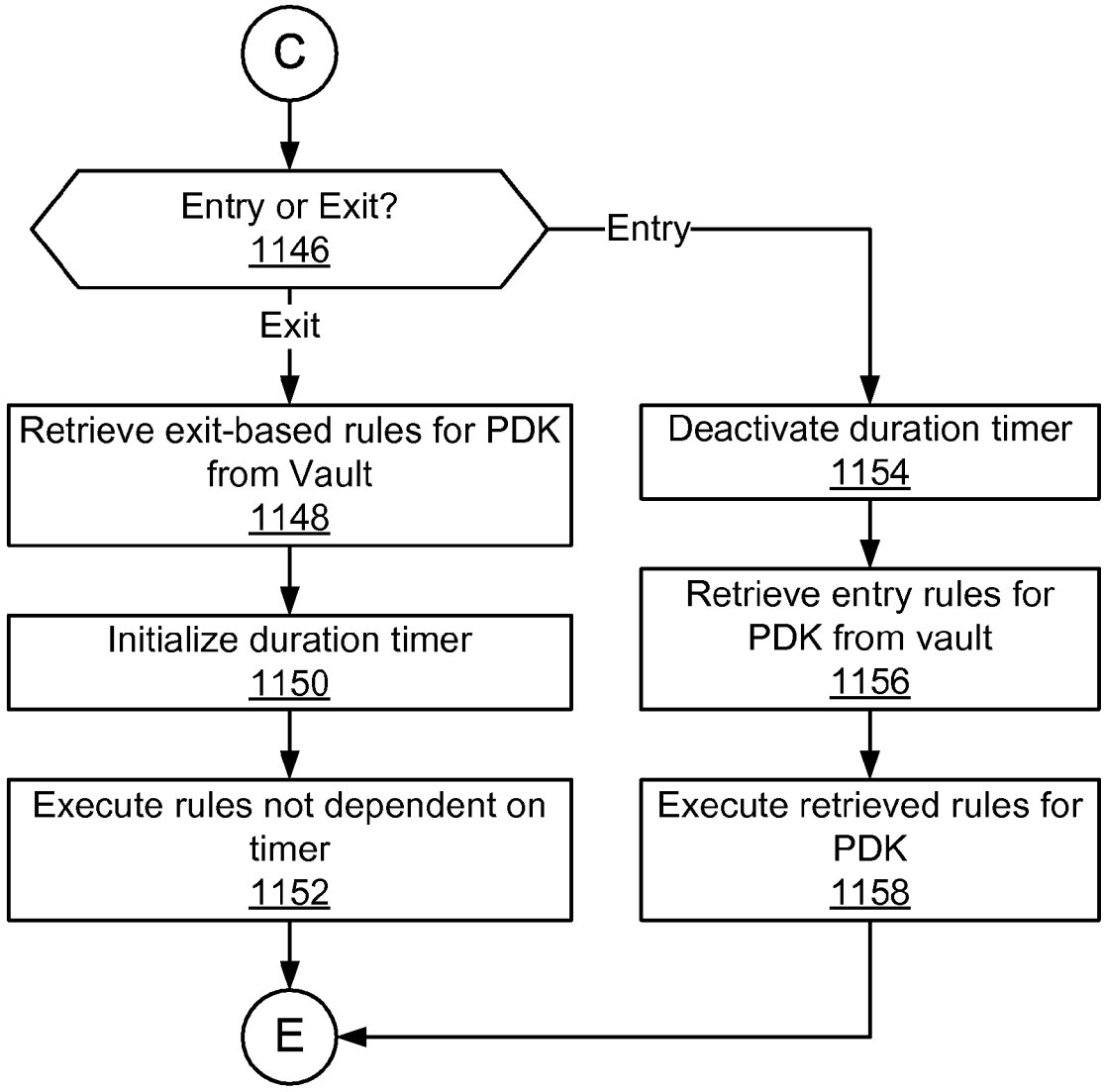

Figure 11D

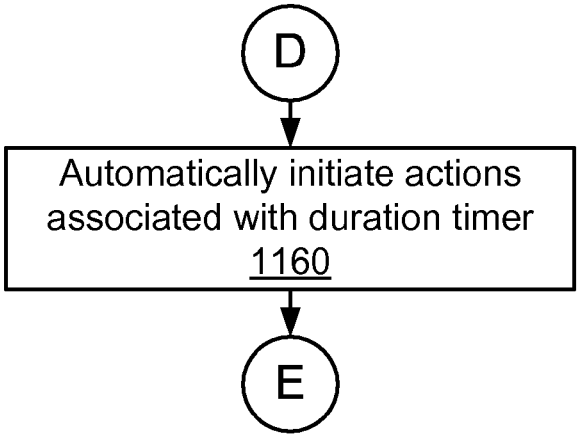

Figure 11E

SECURITY SYSTEM AND METHOD FOR CONTROLLING ACCESS TO COMPUTING RESOURCES

CROSS REFERENCE TO RELATED APPLICATIONS

The present application claims the benefit of priority under 35 U.S.C. §119(e) of U.S. Provisional Application No. 61/015,110 entitled "ProxAccess," filed on Dec. 19, 2007 by John J. Giobbi, the entire contents of which are incorporated by reference herein.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a system and method for controlling access to computing resources. More specifically, the present invention relates to a security system that requires the presence of a personal digital key (PDK) before secure computing resources can be accessed.

2. Description of the Related Art

The use and proliferation of personal computers and other similar computing systems have become widespread. In many cases, a user may have several computers with which she interacts. For example, the user may have a personal computer at their office, a laptop for personal use and a family computer. Additionally, the user may have a cell phone, a personal digital assistant, or other individualized computing devices. Increasingly, these computers store confidential and sensitive information such as contacts lists, financial information, business information and identification information. Most currently existing systems have only a minimal amount of security protection such as requiring a user to enter a password before their personal computer becomes operational.

These computer systems are often used to access third-party systems. These third-party systems often require a user identification name and a password before the user will be granted access. Each of the individual third-party systems often has different requirements both in terms of user name and in terms of password format. Moreover, as the world becomes increasingly digital, the owners of these third-party systems want to ensure security of their systems and prevent fraudulent use. Thus, the third parties often require that the users change their passwords after a predetermined period of time or a predetermined number of accesses to the system. Most users have several external systems, and many users have as many as a hundred of third-party systems that are accessed on a regular basis. Therefore, it is often difficult for users to remember the myriad of user name and password combinations that are required to access such third-party systems and.

Additionally, many of the third-party systems are providing highly confidential information that is received by the end stored on the user's individual computer systems. These data files often contain sensitive information such as bank account records, tax returns, credit card information, and investment information. Furthermore, other personal information is also stored on such computer systems. Such personal information can be used for identity theft in the event that information falls into the wrong hands. While there are file encryption systems and mechanisms in the prior art, these systems are often difficult to use because they require that the user specify which files are encrypted, provide a password, and such

administrative overhead in securing sensitive information stored on the hard drive of a personal computer makes the use of such systems rare.

Thus there is a need for a system and method that secures computing systems automatically and in a nonintrusive way.

SUMMARY OF THE INVENTION

The present invention overcomes the deficiencies of the prior art with a security system and method for controlling access to computing resources. In one embodiment, the security system comprises a personal digital key (PDK), a reader and a computing device. The PDK is a portable, personal transceiver that includes a controller and one or more passwords or codes. The PDK is able to link and communicate with the reader via a wireless radio frequency (RF) signal. The reader is a device that is able to wirelessly communicate with the PDK and also provides a wired output signal line for sending data, applications and other information. The reader is coupled to the computing device. The computing device includes a detection engine, vault storage and a set up module. The detection engine detects events relating to the access any files and third-party systems by the computing device and receives information from the reader as to whether the PDK is present/linked. The detection engine controls whether a user is able to access any of the functionality provided by the computing device based upon whether the PDK is in communication with the reader or not. The PDK and/or the vault storage include encrypted information such as usernames, passwords and other information utilized by the computing device to grant access to components, files and third-party systems. The security system is particularly advantageous because the PDK, reader and computing device automatically cooperate as a security system to either allow or deny access to the functionality provided by the computing device. More specifically, the user need not do anything, while in the background the PDK, the reader and the computing device communicate and exchange information to enable or disable access to information and third-party systems using the computing device. The present invention also includes a number of methods such as a method for initializing the security system, a method for setting up a computing device, and a method for controlling access to computing resources.

The features and advantages described herein are not all-inclusive and many additional features and advantages will be apparent to one of ordinary skill in the art in view of the figures and description. Moreover, it should be noted that the language used in the specification has been principally selected for readability and instructional purposes, and not to limit the scope of the inventive subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is illustrated by way of example, and not by way of limitation in the figures of the accompanying drawings in which like reference numerals are used to refer to similar elements.

FIG. **1** is a block diagram of a first embodiment of a security system in a first state in accordance with the present invention.

FIG. **2** is a block diagram of the first embodiment of the security system in a second state in accordance with the present invention.

FIG. **3** is a perspective view of a plurality of personal digital keys (PDK) in accordance with one embodiment of the present invention.

FIG. **4** is a perspective view of a reader in accordance with one embodiment of the present invention.

FIG. **5** is a block diagram of an embodiment of the PDK in accordance with the present invention.

FIG. **6** is a block diagram of an embodiment of the reader in accordance with the present invention.

FIG. **7** is a block diagram of an embodiment of the computing device in accordance with the present invention.

FIG. **8** is flowchart of a first embodiment of a method for initializing the security system in accordance with the present invention.

FIG. **9** is flowchart of a second embodiment of a method for initializing the security system in accordance with the present invention.

FIG. **10** is graphic representation of a set up user interface in accordance with one embodiment of the present invention.

FIGS. **11**A-**11**E are a flowchart of an embodiment of a method for controlling access to computing resources in accordance with the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

A security system and method for controlling access to computing resources is described. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the invention. It will be apparent, however, to one skilled in the art that the invention can be practiced without these specific details. In other instances, structures and devices are shown in block diagram form in order to avoid obscuring the invention. For example, the present invention is described in one embodiment below with reference to a controlling access to a personal computer. However, those skilled in the art will recognize that the present invention applies to access to any other device that may include a computer or is computer controlled.

Reference in the specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the invention. The appearances of the phrase "in one embodiment" in various places in the specification are not necessarily all referring to the same embodiment. In particular the present invention is described below in the context of two distinct architectures and some of the components are operable in both architectures while others are not.

Some portions of the detailed descriptions that follow are presented in terms of algorithms and symbolic representations of operations on data bits within a computer memory. These algorithmic descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. An algorithm is here, and generally, conceived to be a self consistent sequence of steps leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers or the like.

It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise as apparent from the following discussion, it is appreciated that throughout the description, discussions utilizing terms such as "processing" or "computing" or "calculating" or "determining" or "displaying" or the like, refer to the action and processes of a computer system, or similar electronic computing device, that manipulates and transforms data represented as physical (electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within the computer system memories or registers or other such information storage, transmission or display devices.

The present invention also relates to an apparatus for performing the operations herein. This apparatus may be specially constructed for the required purposes, or it may comprise a general-purpose computer selectively activated or reconfigured by a computer program stored in the computer. Such a computer program may be stored in a computer readable storage medium, such as, but is not limited to, any type of disk including floppy disks, optical disks, CD-ROMs, and magnetic-optical disks, read-only memories (ROMs), random access memories (RAMs), EPROMs, EEPROMs, magnetic or optical cards, or any type of media suitable for storing electronic instructions, each coupled to a computer system bus.

Finally, the algorithms and displays presented herein are not inherently related to any particular computer or other apparatus. Various general-purpose systems may be used with programs in accordance with the teachings herein, or it may prove convenient to construct more specialized apparatuses to perform the required method steps. The required structure for a variety of these systems will appear from the description below. In addition, the present invention is described without reference to any particular programming language. It will be appreciated that a variety of programming languages may be used to implement the teachings of the invention as described herein.

FIG. **1** shows an embodiment of a security system **100** for controlling access to computing resources in accordance with the present invention. The security system **100** comprises a personal digital key (PDK) **102**, a reader **104** and a computing device **106**. As shown in FIG. **1**, the computing device **106** is also coupled by signal line **124** to a network **108**. More particularly, FIG. **1** shows the security system **100** in a first state in which the PDK **102** is linked and in communication with the reader **104**.

The PDK **102** is a portable, personal key that wirelessly communicates (e.g., using radio frequency (RF) signals) with the reader **104**. The PDK **102** includes an area for storing security information including sign-on records, a set up information, user names, passwords, etc. The PDK **102** is will be described below in more detail with reference to FIG. **5**. The PDK **102** also includes logic for initiating and maintaining contact with the reader **104** when it is within range. FIG. **1** illustrates an example where the PDK **102** is within range of the reader **104** and a link **120** has been established between them.

The reader **104** is a device that is able to wirelessly communicate with the PDK **102** and also provides signals on line **122** for sending data, applications and other information to the computing device **106**. One of the major functions of the reader **104** is to detect PDKs **102** within communication range and establish links to them. The reader **104** primarily acts as an intermediary to pass information about the PDK **102** to the computing device **106**. The reader **104** automatically signals the computing device **106** when it is linked to the PDK **102** and when the link **120** is severed. The reader **104** also includes an area for storage of applications and set up

information that can be provided to the computing device **106** during initialization. The reader **104** will be described in more detail below with reference to FIG. **6**.

The computing device **106** may be any conventional device such as but not limited to a personal computer, a laptop computer, a smart phone, a personal digital assistant, etc. The computing device **106** also includes a detection engine **760**, vault storage **762** and a set up module **764** (see FIG. **7**). The detection engine **760** detects events relating to the access any components, files or third-party systems by the computing device **106**. The detection engine **760** also receives information from the reader **104** as to whether the PDK is present or linked. The detection engine **760** controls whether a user is able to access any of the functionality provided by the computing device **106** based upon whether the PDK is in communication with the reader or not. One embodiment for the computing device **106** is described in more detail below with reference to FIG. **7**.

The PDK **102** and/or the vault storage **762** includes encrypted information such as usernames, passwords, and other information utilized by the computing device **106** to grant access to components, files and third-party systems. The present invention is particularly advantageous because the PDK **102**, reader **104** and computing device **106** automatically cooperate as a security system **100** to either allow or deny access to the functionality provided by the computing device **106**. More specifically, the user need not do anything but carry the PDK **102** on his or her person, and in the background the PDK **102**, reader **104** and computing device **106** communicate and exchange information to enable or disable access to information and third-party systems using the computing device.

Referring now FIG. **2**, the same embodiment of the security system **100** described above with reference to FIG-. **1** is shown. However, FIG. **2** depicts a situation in which the PDK **102** has moved outside of communication range with the reader **104** as indicated by arrow **128**. Specifically, FIG. **2** shows a second state in which the PDK **102** is no longer in communication and linked with the reader **104**. Thus, in comparison to FIG. **1**, there is no longer the link **120** between the PDK **102** and the reader **104**. As will be described in more detail below, when the PDK **102** and the reader **104** are within communication range of each other, they automatically establish the link **120**. Similarly, when they are outside of the communication range of each other, the link **120** is automatically severed. Whether the PDK **102** and the reader **104** are in the first state (link) or the second state (no link) is automatically communicated by the reader **104** to the computing device **106** and serves as a control signal to determine whether the functionality provided by the computing device **106** is enabled. More specifically, once the PDK **102** is in the state as shown in FIG. **2**, the computing device **106** is disabled and does not allow the user to use any of the components, files or third-party systems that are typically accessed were part of the computing device **106**.

Referring now to FIG. **3**, a plurality of PDKs **102***a*-**102***d* in accordance with one embodiment of the present invention is shown. As can be seen, the PDKs **102***a*-**102***d* are very small in size being less that 1" X .**5**" X .25". Thus, the PDK **102** is small enough to be attached to a user's key chain or placed in their pocket. In other embodiments, the PDK **102** is integrated as part of a cellular telephone or other portable electronic devices. Furthermore, the PDK **102** is particularly advantageous because it is able to communicate with them and establish the link **120** with corresponding reader **104** even when positioned inside a user's pocket, within clothing or inside a purse or case. Even when obscured from direct view or line of sight, the PDK **102** can establish the link **120** as long as it is positioned within five or less meters of the reader **104**. However, those skilled in the art will realize that the effective communication range between the reader **104** and PDKs **102** is completely scalable and can be distances greater than five meters for other environments and conditions when greater distances are needed. In contrast to the prior art that requires that he be placed within **10** or less inches of the reader, the PDK **102** also does not need to be placed in very close proximity to the reader **104**. Therefore, the security system **100** is particularly advantageous because the PDKs **102** provide a portable, automatic, continuous, effortless way for users to provide security, automatic sign-on and protection, device protection or file protection. The users do not need to remember another username and password or be concerned about its loss. Once the PDK **102** is out of range of the reader **104**, the computing device **106** and the computing resources are provided are secure.

Referring now to FIG. **4**, a perspective view of the reader **104** in accordance with one embodiment of the present invention is shown. In this embodiment, the reader **104** is also small in size being about 2 to 3 times the size of the PDK **102**. The reader **104** also includes an area adapted to receive a PDK **102** in the event the user wants to place the PDK **102** directly on top of the reader **104**. The PDK **102** is coupled to signal line **122** in the form of a cable. At a remote end of the cable it is, it is attached to a USB connector **402**. Using the USB connector **402**, the reader **104** may be directly coupled to the computing device **106**. Those skilled in the art will recognize that in other embodiments, the reader **104** is built into a laptop computer or a personal computer similar to other input/output devices like finger print readers and bar code readers.

Referring now to FIG. **5**, an embodiment of the PDK **102** in accordance with the present invention is described. The PDK **102** comprises a controller **502**, a transceiver **504**, a memory **506** having a secure key storage **512**, an encryption, communication and initialization module **508** and an antenna **510**. The controller **502** is coupled to the transceiver **504**, the memory **506** and the encryption, communication and initialization module **508**. The controller **502** cooperates with the transceiver **504** to send and receive data and control signals to and from the PDK **102**. The controller **502** cooperates with the memory **506** to store and retrieve information from the memory **506**. In particular, the memory **506** includes the secure key storage **512**. The secure key storage **512** can be used to store sign-on records and other set up data. The secure key storage area **512** is also used to store and encrypted user names and passwords. The transceiver **504** is coupled to the antenna **510** and the controller **502**. The transceiver **504** receives and sends information to and from the controller **502** and also generates and receives radio frequency signals. In one embodiment the operation of the PDK **102** is dictated by the encryption, communication and initialization module **508** that is coupled to and controls the operation of the controller **502**. The encryption, communication and initialization module **508** controls the initialization of the PDK **102** such as assigning it a unique ID. The encryption, communication and initialization module **508** also controls the communication of the PDK **102** with the reader **104** such as initializing and establishing the link **120**, maintaining the link **120**, and searching for readers **104** within range. The encryption, communication and initialization module **508** also controls the interaction of the PDK **102** with the reader **104** in terms of responding to requests for information and encrypted and storing information received from the reader **104**. The encryption, communication and initialization module **508**

also includes controls the encryption and decryption of data stored in and retrieved from the memory **506**, in particular the secure key storage **512**.

Additional details about other embodiments of the PDK **102** are shown and described in U.S. patent application Ser. No. 12/292,330, filed a Nov. 30, 2005 entitled "Personal Digital Key And Receiver/Decoder Circuit System And Method;" U.S. patent application Ser. No. 11/620,581, filed Jan. 5, 2007 entitled "Wireless Network Synchronization Of Cells And Client Devices On A Network;" U.S. patent application Ser. No. 11/744,831, filed May. 5, 2007, entitled "Two-Level Authentication For Secure Transactions;" and U.S. patent application Ser. No. 11/744,832, filed May. 5, 2007, entitled "Personal Digital Key Initialization And Registration For Secure Transactions;" the contents of which are incorporated by reference herein in their entirety.

FIG. **6** is a block diagram of an embodiment of the reader **104** in accordance with the present invention. The reader **104** comprises an antenna **602**, a transceiver **604**, a controller **606**, an encryption, communication and initialization module **608** and a memory **610**. The memory **610** further comprises a setup module **612** and secure storage **614**. The antenna **602** is coupled to the transceiver **604** and enables wireless communication between the reader **104** and the PDK **102**. Even though only a single PDK **102** shown in FIGS. **1** and **2**, it should be understood that the reader **104** communicates with and establish a link **120** with a plurality of PDKs **102**. The transceiver **604** is coupled to the controller **606** to provide data received from the PDK **102** and to send data to the PDK **102**. The controller **606** is coupled to and controlled by the encryption, authentication and initialization module **608**. The encryption, authentication and initialization module **608** provides functionality similar to that described above with reference to FIG. **5**, but for the reader **104**. For example, the controller **606** under the direction and control of the encryption, authentication and initialization module **608**: encrypts and decrypts information for storage in and retrieval from the memory **610**, respectively; initializes the reader **104** such as recording setup information in the setup module **612** of the memory **610**; and controls the communication with the PDK **102** via link **120** and the communication with the computing device **106** via signal line **122**. As noted above, the memory **610** includes a setup module **612** and secure storage **614**. The reader **104** includes two types of set up information that are stored in the setup module **612**. First, set up information that is utilized for the reader **104** itself is stored in the setup module **612**. Second, set up information that is sent to and loaded into the computing device **106** to initialize the computing device **106** is also stored in the setup module **612**. In another embodiment, the setup module **612** also includes any other applications needed, and these applications can be loaded from the setup module **612** into the computing device **106**. Under the direction of the encryption, communication and initialization module **608** the controller **606** retrieves this information from the setup module **612** and loads it into the computing device **106**. The reader **104** also includes secure storage **614** for use when critical confidential data is passed from the PDK **102** through the reader **104** to the computing device **106**. The secure storage **614** is used in conjunction with the encryption functionality provided by module **608** to store unencrypted data. The secure storage **614** is also used to store back-up passwords used to allow access to the computing device **106** when the PDK **102** is not in range.

Additional details about other embodiments of the reader or RDC **104** are shown and described in U.S. patent application Ser. No. 12/292,330, filed a Nov. 30, 2005 entitled "Personal Digital Key And Receiver/Decoder Circuit System And Method;" U.S. patent application Ser. No. 11/620,581, filed Jan. 5, 2007 entitled "Wireless Network Synchronization Of Cells And Client Devices On A Network;" U.S. patent application Ser. No. 11/744,831, filed May. 5, 2007, entitled "Two-Level Authentication For Secure Transactions;" and U.S. patent application Ser. No. 11/744,832, filed May. 5, 2007, entitled "Personal Digital Key Initialization And Registration For Secure Transactions;" the contents of which are incorporated by reference herein in their entirety.

Referring now also to FIG. **7**, a functional block diagram of the computing device **106** configured in accordance with an embodiment of the present invention is shown. The computing device **106** comprises a control unit **750**, a display device **710**, an input device **712** and a Universal Serial Bus (USB) interface **714**. The computing device **106** may optionally include a network controller **716** and one or more input/output (I/O) devices **718**. Those skilled in the art will recognize that FIG. **7** nearly depicts one embodiment of the computing device **106** in which it is a personal computer, and that their variety of other embodiments where the computing device **106** has a different configuration. Nonetheless, in most of these other configurations some or all of the components described below with reference to FIG. **7** have a similar or equivalent functionality in the other embodiments of the computing device **106**.

The control unit **750** comprises an arithmetic logic unit, a microprocessor, a general purpose computer or some other information appliance equipped to provide electronic display signals to display device **710**. In one embodiment, the control unit **750** comprises a general purpose computer having a graphical user interface, which may be generated by, for example, a program written in Java running on top of an operating system like WINDOWS® or UNIX® based operating systems. In one embodiment, one or more application programs are executed by control unit **750** including, without limitation, drawing applications, word processing applications, electronic mail applications, financial applications and web browser applications.

Still referring to FIG. **7**, the control unit **750** is shown as including processor **702**, memory **704** and data storage device **706**, all of which are communicatively coupled to system bus **708**.

Processor **702** processes data signals and may comprise various computing architectures including a complex instruction set computer (CISC) architecture, a reduced instruction set computer (RISC) architecture, or an architecture implementing a combination of instruction sets. Although only a single processor is shown in FIG. **7**, multiple processors may be included.

Memory **704** stores instructions and/or data that may be executed by processor **702**. The instructions and/or data may comprise code for performing any and/or all of the techniques described herein. Memory **704** may be a dynamic random access memory (DRAM) device, a static random access memory (SRAM) device, some other memory device known in the art or any combinations of the preceding. In one embodiment, the memory **704** also includes an operating system such as one of a conventional type such as, WINDOWS®, SOLARIS® or LINUX® based operating systems. Although not shown, the memory unit **704** may also include one or more application programs including, without limitation, drawing applications, word processing applications, electronic mail applications, financial applications and web browser applications. Those skilled in the art will recognized that while the present invention will now be described as modules or portions of a memory unit **704** of a computer system **100**, the modules or portions thereof may also be

stored in other media such as permanent data storage device **706** and may be distributed across a network **108** having a plurality of different computers such as in a client/server environment. The memory **704** is shown as including a detection engine **760**, vault storage **762** and a set up module **764**. These modules **760**, **762**, **764** are coupled by bus **708** to the processor **702** for communication and cooperation to system **100**.

The detection engine **760** is instructions and/or data that may be executed by processor **702**. The instructions and/or data comprise code for performing any and/or all of the techniques described herein. More specifically, the detection engine **760** detects when a protected item is accessed, performs the process steps as specified by a set up record and also controls the processor **702** to perform encryption and decryption as necessary. The operation of the detection engine **760** is described in more detail below with reference to FIG. **11**A-**11**D. The detection engine **760** is coupled to control the processor **702**. The detection engine **760** is also coupled to the protected items **780** and/or the processor **702** to determine when the protected items **780** are accessed. For example, the detection engine **760** is coupled to either the processor **702** or this data storage device **706** to determine when the protected items **780** are accessed.

The vault storage **762** is a portion of memory **704** used to store information utilized by the detection engine **760** to control operation of the security system **100** of the present invention. In one embodiment, the vault storage **762** is encrypted so that its contents cannot be accessed and utilized by other devices or programs or decoded for circumvention. In another embodiment, the vault storage **762** is locked or controlled in a manner such that only the detection engine **760** may access and use the information stored in the vault storage **762**. The vault storage **762** stores security set up data for the secure items on the computing device **106**. For example, this security set up data includes a plurality of item set up records, where each item set up record corresponds to a protected item **780**. It should be understood that the vault storage **762** includes one vault file per computing device **106**/PDK **102** pair. The PDK **102** of the computing device **106**/PDK **102** pair is preferably a master PDK. In another embodiment, the vault file also includes information about other proxy PDKs related to the master PDK and a backup password. The set up records stored in the vault file corresponding to each of the protected items **780** and specify the process that must be undertaken in order to grant access to the particular protected item **780**. In a second embodiment, the vault storage **762** includes a plurality the sub-vaults, optionally implemented utilizing a directory/subdirectory where each "secured type" is maintained in its own file. An extension of this concept includes maintaining complete subdirectories (within the primary Vault directory) for each "secured type" (in place of individual files for each). In a third embodiment, the vault storage **762** is maintained as a group of individual files (within a primary Vault directory), and the processor **702** gathers analytics data such a key use, access privileges, usage stats, etc, for each. In a fourth embodiment, the vault storage **762** is located on the PDK **102** as opposed to the computing device **106**. This option enables additional methods for managing secured files as they are moved, copied, and transferred. As with the vault storage **762** located on computing device **106**, a "backup" password may also be utilized to unlock access to the vault storage **762** in situations where biometric authentication options are unavailable. In a fifth embodiment, the vault storage **762** is utilize an "assigned ID", stored in & read from the PDK **102**, in addition to, or in place of, a PDK's ID. This option enables another method for allowing multiple PDKs to access secured types as a "group". Example uses include enabling groups of PDKs/users to access files, storage devices, and even applications.

The set up module **764** is instructions and/or data that may be executed by processor **702** for initializing and setting up the computing device **106**. The operation of the set up module **764** is described in more detail below with reference to FIGS. **8** and **9**. The set up module **764** cooperates with the set up module **612** of the reader **104**. In particular, the set up module **764** accesses the reader **104** to retrieve set up module **612** and copy that information into the memory **704** of the computing device **106**. The set up module **612** is then executed by the processor **702** to generate the item setup records and store them in the vault storage **762**. The set up module **612** also retrieves additional applications stored at the reader **104** and install and upload them on the memory of the computing device **106**.

Data storage device **706** stores data and instructions for processor **702** and comprises one or more devices including a hard disk drive, a floppy disk drive, a CD-ROM device, a DVD-ROM device, a DVD-RAM device, a DVD-RW device, a flash memory device, or some other mass storage device known in the art. In one embodiment, the data storage device **706** also stores protected items **780**. For example, the protected items **780** include storage devices such as data storage device **706**, directories and files such as for data on the data storage device **706** and sign-on screens such as generated in a web browser. If a storage device is a protected item **780** that means that all data on the storage device is encrypted and access to it is protected. If directories or files are protected items **780**, that means that the directory or file is encrypted and access is protected. If a sign-on screen is a protected item **780**, any time that sign-on screen is displayed, the detection engine **760** detects its display and retrieves information necessary to complete the sign-on screen from a corresponding item set up record in the vault storage **762** and processes as needed. In other embodiments, protected items **780** includes information used in e-commerce, electronic signatures, digital signatures, licensee key management information for digital rights management.

System bus **708** represents a shared bus for communicating information and data throughout control unit **750**. System bus **708** may represent one or more buses including an industry standard architecture (ISA) bus, a peripheral component interconnect (PCI) bus, a universal serial bus (USB), or some other bus known in the art to provide similar functionality. Additional components coupled to control unit **750** through system bus **708** include the display device **710**, the input device **712**, the USB interface **714**, the network controller **716** and the I/O device(s) **718**.

The display device **710** represents any device equipped to display electronic images and data as described herein. In one embodiment, the display device **710** is a liquid crystal display (LCD) and light emitting diodes (LEDs) similar to those on many personal computers to provide status feedback, operation settings and other information to the user. In other embodiments, the display device **710** may be, for example, a cathode ray tube (CRT) or any other similarly equipped display device, screen or monitor. In one embodiment, the display device **710** is equipped with a touch screen and/or includes a digitizer in which a touch-sensitive, transparent panel covers the screen of display device **710**.

In one embodiment, the input device **712** is a series of buttons coupled to control unit **750** to communicate information and command selections to processor **702**. The buttons are similar to those on any conventional computer. In another embodiment, the input device **712** includes a keyboard. The

keyboard can be a QWERTY keyboard, a key pad, or representations of such created on a touch screen. In yet another embodiment, the input device **712** includes cursor control. Cursor control represents a user input device equipped to communicate positional data as well as command selections to processor **702**. Cursor control **712** may include a mouse, a trackball, a stylus, a pen, a touch screen, cursor direction keys or other mechanisms to cause movement of a cursor.

The USB interface **714** is of a conventional type and is coupled to bus **708** for communication with the processor **702**.

The network controller **716** links control unit **750** to a network **108** via signal line **124**. The network may comprise a local area network (LAN), a wide area network (WAN) (e.g., the Internet), and/or any other interconnected data path across which multiple devices may communicate. The control unit **750** also has other conventional connections to other systems such as a network for distribution of files (media objects) using standard network protocols such as TCP/IP, http, https, and SMTP as will be understood to those skilled in the art.

As denoted by dashed lines, the computing device **106** may optionally include one or more input/output (I/O) devices **718** such as described below. One or more I/O devices **718** are coupled to the bus **708**. These I/O devices may be part of computing device **106** in one embodiment and in another embodiment may be part of the other systems (not shown). For example, the I/O device **718** can include an image scanner for capturing an image of a document. The I/O device **718** may also includes a printer for generating documents. The I/O device **718** may also include audio input/output device equipped to receive audio input via a microphone and transmit audio output via speakers. In one embodiment, audio device is a general purpose; audio add-in/expansion card designed for use within a general purpose computer system. Optionally, I/O audio device may include one or more analog-to-digital or digital-to-analog converters, and/or one or more digital signal processors to facilitate audio processing.

It should be apparent to one skilled in the art that system **100** may include more or less components than those shown in FIG. **7** without departing from the spirit and scope of the present invention. For example, security system **100** may include additional memory, such as, for example, a first or second level cache, or one or more application specific integrated circuits (ASICs). Similarly, additional components input/output devices **718** may be coupled to control unit **750** including, for example, an RFID tag reader, digital still or video cameras, or other devices that may or may not be equipped to capture and/or download electronic data to control unit **750**. One or more components could also be eliminated such as the keyboard & cursor control **712**.

FIG. **8** shows a first embodiment of a method for initializing the security system **100** in accordance with the present invention. The method begins by connecting **802** the reader **104** to the computing device **106** and initialize reader **104**. Once reader **104** is connected to the computing device **106**, it receives power from computing device **106**. The reader **104** upon power up performs **802** initialization of its own systems and also begins communication with the computing device **106**. In particular, the reader **104** loads drivers on the computing device **106** such as its operating system (e.g., Windows) so that the reader **104** and the computing device **106** can communicate with each other. In another embodiment, the drivers may be provided on another media such as a flash drive or CD and loaded into the computing device in a conventional manner. Once the reader **104** is operational it is like a portal, in that it can link and communicate with any PDK **102**. Next, the computing device **106** is initialized **804**. More specifically, the computing device **106** downloads and runs the setup module **612** from the reader **104**. This will also cause other applications required to be downloaded from the reader **104** to the computing device **106**. Once the programs are downloaded from the reader **104** they are loaded and started. For example, the configuration application that generate and present the user interface of FIG. **10** is operation and presents the user interface **1000** so that the user's preferences for operation of the security system **100** can be entered. The initialization step **804** also creates the vault storage **764** on the computing device, load and start the detection engine **760**. Finally, a PDK **102** is linked **806** to the reader **104** and initialized. In one embodiment, it is assumed that the PDK **102** has already been activated and associated with a user. Part of this activation process includes giving the PDK **102** a unique ID number and storing confidential information such as passwords and other data unique to the user in the PDK **102**. The initialization of the PDK **102** process continues by identifying the PDK **102** and its unique ID so that this information can be used to determine when the PDK **102** comes within range of the reader **104** in the future. In particular, the PDK **102** is associated with the vault storage created in step **804**. The first PDK **102** to interacts with the initialized computing device **106** is the master PDK **102**. The master PDK **102** is the owner of the vault and acts like an administrator with the authorization to give proxies to other PDKs **102** that will allow them to access the vault but typically not to grant access to other PDKs **102**. When the other PDKs are in range, the set up functionality of the computing device **106** is used for this assignment of rights (See FIG. **10**, area **1012** below.) Once this is complete, the security system **100** is operational and ready for use.

Referring now to FIG. **9**, a second embodiment of the method for initializing the security system **100** in accordance with the present invention is shown. The method begins by identifying **902** computing resources in the computing device **106** and the PDK **104**. This effectively identifies all possible items that can be protected items and thus subject to the access control and security constraints of the security system **100**. This includes identifying disk drives, directories, files and sign-on screens that will be accessed via the security system **100**. The method also identifies **902** PDKs **102** and the computing resource with which they are associated. Next, the method creates **904** a local vault or allocates memory **704** to create vault storage **762**. The method then presents **906** a user interface on the computing device **106**. For example, this is done with the user interface **1000** of FIG. **10** which will be described below. The user interacts with the interface **1000** and inputs a variety of a set up parameters. The computing device **106** receives **908** the setup parameters. Then the method creates **910** an item set up record with the parameters received from step **908** and specifying the processes performed when interacting with the item. The item set up record is a data record for a particular item holding the details of the detection engine **760** requires to correctly process (allow access or otherwise interact with) the item. In one embodiment, the item set up record includes information about how to access the item, whether the data is encrypted, etc. but does not store the decryption key or other actual security data as it is provided by the PDK **102**. Next, the method stores **912** the item set up record in the vault storage **762** or local law. In some embodiments, the PDK **102** stores login information passwords such as needed for sign-on screens. For such cases the method also stores **914** this information in the PDK **102** during this initialization process. The present invention is particularly advantageous because the item set up records are

stored in the vault storage **762** while the login information needed for sign-on is stored in the PDK **102**, thus enabling maximum mobility. It should be understood that the reader **104** does not store any runtime information but merely acts as a means for the PDK to interact with the computing device **106**, in particular, the protected items **708**. When the security system **100** is operational, the detection engine **760** searches the vault storage **762** for instructions on how interaction with the protected item is undertaken at and accesses the PDK **102** if needed as appropriate. It should be understood that in one embodiment, the item set up records are processed hierarchically where the set up rules specified in a item set up record for file override the set up rules specified in an item set up record for directories, and the set up rules specified in an item set up record for a directory overrides the set up rules specified in an item set up record for a component (e.g., the entire data storage device **706**).

As also shown in FIG. **9**, in addition to the manual setup using user interface **1000** of FIG. **10** when the security system **100** is initially put into operation, the user may at any time during normal use **920** input command indicating that they would like to apply security constraints to an item. For example, during all operation of the computing device **106**, the user may just drive and right click the mouse cursor on the icon to input a set up command to the security system **100**. The system receives **922** set up command and then proceeds to perform steps **906** through **914** as has been described above. This is particularly advantageous because it allows the user at any time to modify, add or remove security controls from protected item.

Referring now FIG. **10**, one embodiment of the set up user interface **1000** in accordance with the present invention will be described. The user interface **1000** includes a plurality of areas **1002**, **1004**, **1006**, **1008**, **1010**, **1012**, **1014** and **1016** to specify the item to be protected as well as actions or rules to be followed in granting access to the protected item. In a first region **1002**, the user interface **1000** present buttons representing major categories of items that can be protected. For example, the buttons shown in FIG. **10** are three possible protected items including: storage devices, directories and files, and sign-on screens. In another embodiment, additional buttons may be provided for services such as e-commerce, digital signature, and electronic identification. Those skilled in the art will recognized that any number of buttons may be provided depending on the categories of items that are protected by the security system **100**. Selecting a button in the first region **1002**, causes the items displayed in window **1016** to be limited to those items that are in the selected category. The window **1016** may also be used to select a particular item from the list of items displayed in the window **1016**. However as shown in FIG. **10**, since no button has been selected the items of all categories are shown in the window **1016**. Below the window **1016**, the user interface **1000** presents a series of buttons **1014** selectable to add, delete or save the input parameters of the user interface **1000** as an item set up record. An additional button is provided for canceling the setup process. Those skilled in the art will recognize that a similar version to the user interface **1000** shown in FIG. **10**, but pre-populated with information about a specific device or item, is presented when the user accesses the set up interface **1000** via a direct command (e.g., right mouse click) such as described above with reference to step **922** of FIG. **9**. The regions **1004**, **1006**, **1008** on the right side of the user interface **1000** provides regions in which the user can specify what actions the security system **100** will perform when allowing or denying access to the protected items. For example, region **1004** presents options for whether access will be automatically allowed when the PDK **102** is detected as being within range of that reader **104**. Region **1006** specifies reconfirmation options in which the user can specify how often the security system **100** must confirm that the PDK **102** continues to be within range of the reader **104**. Moreover, the user can specify that biometric confirmation is required in addition to the PDK **102** being present. Such biometric confirmation can be provided by a biometric reader on the PDK **102**, the reader **104** or other device connected to the computing device **106**. Region **1008** allows the user to specify automatic securing options for specifying what action will be taken by the security system **100** when the PDK **102** is not detected, or a PDK **102** removal event is received. Yet another region **1010** allows the user to specify a number of other miscellaneous options. These miscellaneous options may be presented or removed depending on the type of item selected and displayed in window **1016**. One option is to keep a copy of the item set up record in the PDK **102**. This option is only available for the sign on setup. Another option is to apply settings to all directories and files (overriding their items set up record). This option is only available when the item type is a storage device or a directory. A third miscellaneous option is displaying a secure screensaver when the auto-secure option is enabled and the PDK is no longer detected. While this option is available for any item it has a default setting of being selected for all items. Finally, the last region **1012** provides an area in which PDKs **102** can be grouped or assigned proxies. This last region **1012** also provides an option for inputting a backup password that can be used to enable the system when the PDK **102** is not available.

Referring now to FIGS. **11A-11E**, an embodiment of a method for controlling access to computing resources in accordance with the present invention is described. Referring specifically to the FIG. **11A**, the method begins by monitoring **1102** for an event or trigger. An event is any attempt by the computing device **106** to access a storage device, to access a directory, to access a file, any time a login screen is displayed, or any time based trigger. While the present invention will now be described in the context of these events, those skilled in the art will recognize that other events involving the use of other computing resources of the computing system **106** may also have an item set up record established and stored in the vault storage **762** such that the use of those computing resources is controlled by the security system **100** of the present invention in a manner similar to that described below for storage devices, files, directories and sign-on screens. Next, the method determines **1104** whether an event was detected. In one embodiment, the monitoring and detecting is performed by detection engine **760**. If the method determines that an event was not detected, the method returns to step **1102** to continue to monitor for events. However, if the method determines that an event was detected the method continues in step **1106**. In steps **1106**, **1108**, **1110** and **1112**, the method proceeds to determine the event type and perform the associated steps for that event type. If an event was detected but is not any of the types that the security system **100** protects, the method continues in step **1114** and processes the event and allows access to the computing resource as normal after which the process is complete and ends

Referring now also to FIG. **11B**, in step **1106**, the method determines whether the event is an access to a secure device, file or directory. If not the method continues to step **1108** to determine whether the event was the presentation of a sign-on screen. However, if the method determined that the event is to access a secure device, the method continues to step **1116** of the FIG. **11B**. The method determines **1116** the device, directory or file being accessed. Then the method retrieves **1118**

the item set up record for the device, directory or file determined in step **1116** from the vault storage **762** and determines requirements for allowing access to the storage device directory or file. For example, the item set up record may specify whether access requires encryption. Those skilled in the art will recognize that any number of other requirements may be enforced by the security system **100** by adding them as requirements to the item set up record. These steps for the protected item will be performed as it is accessed and after the PDK identified in the item step up record is validated. Next, the method performs validation **1120** of PDK **102**. In particular, the detection engine utilizes the reader **104** to conduct the appropriate authentication/validation, for example, requiring that the PDK **102** associated with the item set up record be within range of the reader **104**. Then the method tests **1122** whether the PDK **102** was validated. If not the method is complete and ends with the security system **100** precluding access to the device, files or directory. In one embodiment, the security system **100** also displays appropriate message indicating that access was denied and correct steps that can be taken. On the other hand, if the PDK **102** was validated, the method transitions from step **1122** to step **1114** of FIG. **11**A to process the event and allow access as normal. The requirements from the item set up record are also preformed prior to or during normal access to the device, files or directory

In step **1108**, the method determines whether the event was the presentation of a sign-on screen. If not the method continues to step **1110**. However, if the method determined that the event was the presentation of a sign-on screen, the method continues to step **1124** of the FIG. **11**C. Initially, the method determines whether an item setup record corresponding to the sign-on screen exists. If so, the method retrieves **1126** the item setup record from the vault storage **762**. Then the method performs validation of **1128** of the PDK **102** and determines **1130** whether the PDK **102** is valid. If not the method is complete and ends with the security system **100** denying access to access to the sign-on screen, and thus other third party systems. However if the PDK **102** is validated, the detection engine **760** automatically fills in the fields of the sign-on screen with the information from the item setup record and submits the data for log-in. The method then returns to step **1114** of FIG. **11**A to continue processing as normal. However if in step **1124**, it is determined that an item set up record corresponding to the sign-on screen does not exist, the method prompts the user to determine whether to create **1134** an item setup record for this sign-on screen. If the user does not want to create a setup record, the method proceeds to step **1144** and prompts the user to manually enter the sign-on information and then continues to step **1114** of FIG. **11**A to continue processing as normal. However, if the user does want to create a setup record for future use for this sign-on screen, the method continues to determine the PDK **102** for the user and whether it is in range. Then the method determines **1138** whether the PDK **102** is valid. If not, the method is complete and ends. Since the user does not have a valid PDK **102** they are not allowed to create a new record in the security system **100**. On the other hand if the PDK **102** is determined to be valid in step **1138**, the method prompts **1140** the user for sign-on information and receives the sign-on information. Then the method creates **1142** a new set up record corresponding to the sign-on screen and including the sign-on information received in step **1140** and stores it in the vault storage **762**. The method continues to automatically fill in **1132** the fields and submit the data for login after which it proceeds to step **1114** of FIG. **11**A for processing as normal.

In step **1110**, the method determines whether the event was the detection of a PDK **102** entering or exiting the range of the reader **104**. If not, the method proceeds to step **1112** tests for other types of events. However if the method determined that the event was the detection of a PDK **102** entering or exiting the range of the reader **104**, the method proceeds to step **1146** of FIG. **11**D. In step **1146**, the method determines whether the event was the entry or exit of the PDK **102**. If it was the exit of the PDK **102** from the range of the reader **104**, the detection engine **760** retrieves **1148** exit-based rules corresponding to the PDK **102** from the vault storage **762**. The detection engine **760** also determines which if any of the exit-based rules have a time dependency (e.g., an amount of time must lapse before they can be performed.) Then the detection engine **760** initializes **1150** the duration timer and provides it with the time dependent exit rules. Next, the method executes rules that are not dependent upon the duration timer and that should be executed when the PDK **102** exits the range of the reader **104**. For example, depending on the configuration parameters entered by the user during initialization, some of the actions taken when the PDK exits the range of the reader **104** will be executed immediately once removal of the PDK **102** from the vicinity of the reader **104** is detected. Any such actions can be determined by reading the item set up record. Examples of such actions include automatically logging out, closing a window, or initializing the screensaver. After step **1152**, the method transitions back to step **1114** of FIG. **11**A. If in step **1146** the event was a determined to be the entry of a PDK **102** into the range of the reader **104** the method continues to deactivate **1154** any timers associated with the PDK **102** that are operational. The method retrieves **1156** an item set up record corresponding to the PDK **102** from the vault storage **762**. The method then extracts rules from the item set up record and executes **1158** the extracted rules. For example, actions such as clearing a screensaver, launching a window, or retrieving, entering and submitting login data are executed in step **1158**. After step **1158**, the method transitions back to step **1114** of FIG. **11**A.

In step **1112**, the method determines whether the event was the detection of expiration of the duration timer. If not, the method proceeds to step **1114** to allow access as normal. However, if the event was the detection of expiration of the duration timer, the method continues in step **1160** of FIG. **11**E. In step **1160**, the method determines automatically initiates action associated with the duration time. For example, these are any action specified by the item set up record when the duration timer was started. They can include logging out, activating a screen saver, etc. as specified above as immediate actions. Those skilled in the art will recognize that there may be a variety of times where the duration timer is set to avoid the security system **100** to initiate action, even though the PDK **102** has only be out of range momentarily.

The foregoing description of the embodiments of the present invention has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the present invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching. It is intended that the scope of the present invention be limited not by this detailed description, but rather by the claims of this application. As will be understood by those familiar with the art, the present invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. Likewise, the particular naming and division of the modules, routines, features, attributes, methodologies and other aspects are not mandatory or significant, and the mechanisms that implement the present invention or its features may have different names, divisions and/or formats. Furthermore, as will be apparent to one of ordinary skill in the relevant art, the modules, routines,

features, attributes, methodologies and other aspects of the present invention can be implemented as software, hardware, firmware or any combination of the three. Also, wherever a component, an example of which is a module, of the present invention is implemented as software, the component can be implemented as a standalone program, as part of a larger program, as a plurality of separate programs, as a statically or dynamically linked library, as a kernel loadable module, as a device driver, and/or in every and any other way known now or in the future to those of ordinary skill in the art of computer programming. Additionally, the present invention is in no way limited to implementation in any specific programming language, or for any specific operating system or environment. Accordingly, the disclosure of the present invention is intended to be illustrative, but not limiting, of the scope of the present invention, which is set forth in the following claims.

The invention claimed is:

1. A system for securing computing resources, the system comprising:

a personal digital key adapted for wireless communication within a predefined range to establish a link and send and receive data, the personal digital key associated with a user and storing security data used to access a particular computing resource as described by security set up data for the particular computing resource;

a reader for automatically detecting the presence of the personal digital key and establishing a link with the personal digital key, the reader having an input and an output and adapted for wireless communication with the personal digital key when the reader and the personal digital key are within the predefined range of each other, the reader automatically signaling a computing device whether it is linked to the personal digital key; and

the computing device having computing resources including the particular computing resource, the computing device coupled to the input and the output of the reader for sending and receiving data; the computing device including a security system for controlling access to the computing resources of the computing device based on security set up data, wherein the security set up data is stored in a dedicated encrypted portion of a memory of the computing device and includes information on how to control access to the computing resources using security data, but does not include the security data used to obtain access, wherein the security set up data is based on one or more user defined options allowing the user to implement different security actions for different computing resources, wherein the different security actions include a biometric confirmation for a respective computing resource, the security system controlled by the signal from the reader indicating whether the reader is linked to the personal digital key and terminating access to the computing resource based on an exit-based rule of the security set up data associated with the computing resource when the personal digital key and the reader are no longer within the predefined range.

2. The system of claim **1** wherein the personal digital key includes a memory for storing security information.

3. The system of claim **2** wherein the security information includes sign-on information, set up information, user names and passwords.

4. The system of claim **1** wherein the reader includes a set up module for storing set up information utilized by the computing device to install the security system.

5. The system of claim **4** wherein the reader sends the set up information to the computing device during an initialization stage.

6. The system of claim **1** wherein the reader includes a transceiver for wirelessly communicating with the personal digital key and a USB connector for coupling to the computing device.

7. The system of claim **1** wherein the reader includes secure storage for storing back-up passwords used to allow access to the computing device when the personal digital key is not in range.

8. The system of claim **1** wherein the security system includes a detection engine for detecting when a computing resource is accessed and controlling

whether access will be permitted, the detection engine coupled to control the computing device.

9. The system of claim **1** wherein the security system includes a set up module for initializing and installing a detection engine and the dedicated, encrypted portion of the memory of the computing device storing the security set up data, the set up module adapted for cooperation with the computing device.

10. A security system for controlling access to computing resources on a computing device, the security system comprising:

a detection engine for detecting when a computing resource is accessed and controlling whether access is permitted based on detecting a personal digital key within a predefined range of a reader and based on security set up data, the detection engine coupled to the computing device and the computing resources; and

a vault storage for storing security set up data for the computing resources, the vault storage stored in a dedicated encrypted portion of a memory of the computing device and including information on how to use security data stored by the personal digital key to control access to the computing resources, but does not include the security data used to obtain access, wherein the security set up data is based on one or more user defined options allowing a user to implement different security actions for different computing resources, wherein the different security actions include a biometric confirmation for a respective computing resource, the security set up data specifying at least one security action for the accessed computing resource, the at least one security action including an exitbased rule to terminate access to the computing resource when the personal digital key and the reader are no longer within the predefined range, the vault storage coupled to and accessible by the detection engine.

11. The security system of claim **10** comprising a set up module for initializing and installing the detection engine and the vault storage on the computing device, the set up module adapted for cooperation with the computing device.

12. A method for controlling access to a computing device having computing resources, the method comprising:

monitoring, with the computing device, for an event;

detecting, with the computing device, the event;

determining whether a personal digital key is within a predefined range of the computing device responsive to detecting the event;

allowing access to a computing resource when the personal digital key is within a predefined range of the computing device based on security data stored by the personal digital key and an item set up record stored in a dedicated encrypted portion of a memory of the computing device and including information on how to use the security data stored by the personal digital key to control access to the computing resource, the item set up record lacking the security data; and

terminating access to the computing resource when the personal digital key is no longer within the predefined range of the computing device,

wherein allowing and terminating access is based on the item set up record associated with the computing resource, the item set up record including one or more user defined options allowing a user to implement different security actions for different computing resources, wherein the different security actions include a biometric confirmation for a respective computing resource.

13. The method of claim **12** wherein the event is one from the group of any attempt by the computing device to access a storage device, to access a directory, to access a file, any time a login screen is displayed or any time based trigger.

14. The method of claim **12** wherein determining whether a personal digital key is within the predefined range of the computing device includes receiving a control signal from a reader.

15. The method of claim **14** wherein determining whether the personal digital key is within the predefined range of the computing device includes determining whether the personal digital key is wirelessly linked to the reader coupled to the computing device.

16. The method of claim **12** wherein allowing access to one of the computing resources includes:

determining an item accessed; retrieving the item set up record corresponding to the determined item; and performing an action specified in the set up record.

17. The method of claim **16** wherein the action includes one from a group of clearing a screensaver, starting a screen saver, launching a window, closing a window, encrypting information, decrypting information, retrieving a password, storing a password or retrieving, entering and submitting login data.

18. The method of claim **12** wherein allowing access to the computing resource includes:

determining that item is accessed;

retrieving the item set up record corresponding to the determined item, the item set up record including a user name and password; and

automatically completing a sign-on screen by filling in fields using the user name and password, wherein the security data includes the username and password.

19. The method of claim **18** wherein retrieving the item set up record includes communicating with a personal digital key to retrieve the user name and password from the personal digital key.

20. The method of claim **12** wherein allowing access to the computing resource includes:

determining whether the item set up record exists for the one of the computing resources; identifying the personal digital key; receiving parameters for the item set up record; and creating a set up record including an identifier of the personal digital key and the received parameters.

21. The method of claim **12** comprising:

determining that the personal digital key (PDK) has moved within the predefined range of the computing device;

deactivating a duration timer;

retrieving entry rules associated with the PDK; and executing the retrieved rules.

22. The method of claim **12** comprising:

determining that the personal digital key (PDK) has moved outside the predefined range of the computing device;

retrieving exit rules associated with the PDK; and

executing the retrieved exit rules.

23. The method of claim **22** comprising: determining time-based rules from the retrieved exit rules; initializing a duration timer with the time based rules; and wherein executing the retrieved exit rules delays until the duration timer has lapsed before executing the time-based rules.

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